REMARKS

Amendment summary

Claim 7 is newly added. Support for this claim may be found, e.g., in Example 2 of the present specification.

No new matter is added by this Amendment, and Applicants submit that entry of the Amendment is proper.

Status of the claims

Claims 1 and 2 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Tanimoto et al. (JP 05-226372) in view of Kuroda et al. (U.S. Patent No. 5,831,296) (hereinafter "Tanimoto" and "Kuroda," respectively).

Response to rejection based on Tanimoto in view of Kuroda

Claims 1 and 2 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Tanimoto in view of Kuroda. Applicants respectfully submit that the presently claimed invention is not rendered obvious by the cited references because, contrary to the position set forth in the Office Action and Advisory Action, the teachings of Kuroda do not indicate that the semiconductor layer in Tanimoto would have the mobility presently claimed.

The present claims recite a compound semiconductor epitaxial substrate for use in a strain channel high electron mobility field effect transistor, comprising an InGaAs layer as a strain channel layer and an AlGaAs layer containing n-type impurities as an electron supplying layer, wherein said InGaAs layer has an electron mobility at room temperature of 8300 $cm^2/V \cdot s$ or more. In addition, undoped GaAs layers having a thickness of 4 nm or more each are

laminated respectively in contact with a top surface and a bottom surface of the strain channel layer and at least one of the undoped GaAs layers is further in contact with an undoped AlGaAs layer. Also, the AlGaAs layer containing n-type impurities is in contact with the undoped AlGaAs layer.

Applicants respectfully submit that it appears from the Advisory Action that the Examiner has misunderstood Applicants' arguments. In particular, the Examiner's statement that "Tanimoto teaches a strain channel layer" does not rebut Applicants' argument that Kuroda does not teach a strain channel layer. Applicants argued, and repeat the arguments below for the Examiner's convenience, that the electron mobility reported in Kuroda's non-strain channel HEMT would not be understood by a person having ordinary skill in the art to apply to Tanimoto's strain channel HEMT. Applicants respectfully request that the Examiner address this argument.

As previously asserted, Applicants respectfully traverse the Office Action's position that the teachings of Kuroda indicate that the semiconductor layer in Tanimoto would have the electron mobility presently claimed. Mr. Osada's Declaration under 37 C.F.R. § 1.132, attached to the Amendment filed on September 22, 2009, explains Applicants' position. In particular, Mr. Osada notes that a person having ordinary skill in the art would understand that the high electron mobility transistor (HEMT) in Kuroda is not the same HEMT disclosed in Tanimoto, and would therefore possess distinct properties. Thus, according to Mr. Osada, a person having ordinary skill in the art would thus understand that the electron mobility reported in Kuroda's HEMT would not be applicable to the HEMT in Tanimoto. The reason is that Kuroda discloses a HEMT, whereas Tanimoto discloses a strain channel HEMT (to which the presently claimed invention relates). A strain channel HEMT has a strain channel layer that is formed by growing

a material on a substrate such as GaAs. The material has a different lattice constant from the substrate, but maintains its crystal structure.

Mr. Osada explains that this is relevant because the electron mobility of the GaAs layer in the GaAs (strain) channel HEMT in Tanimoto is about 8000 cm^2/Vsec (as described by Tanimoto in Paragraph No. [0004]), whereas the electron mobility of the GaAs layer in the (non-strain) HEMT of Kuroda is 8500 cm^2/Vsec. In Mr. Osada's opinion, a person having ordinary skill in the art would not understand from these two references that the strain channel HEMT in Tanimoto would have the electron mobility shown in the non-strain channel of Kuroda. Accordingly, the teachings of Kuroda fail to indicate that the semiconductor layer in Tanimoto would have the electron mobility presently claimed.

With respect to the characterization of Tanimoto in the Office Action, Applicants respectfully submit that Fig. 6 in Tanimoto does not disclose that undoped GaAs layers [2] and [4] have a thickness of 2 to 4 nm. Instead, Tanimoto in paragraph [0004] states that:

"For example, when spacer layer width is not less than 20 nm in the case of GaAs channel layer HEMT, electron mobility becomes about 8000 cm^2/Vsec, the maximum value that is attainable by GaAs. However, if spacer layer width is too large, the number of carries produced in a channel will decrease and as a result mutual conductance will also decrease. Usually, the optimum value of spacer layer width was about 2 to 4 nm, at which the electron mobility was 5000 cm^2/Vsec."

Mr. Osada explains that Paragraph No. [0004] in Tanimoto only explains the defects or problems that exist in the prior art and which need to be solved. This passage does not relate to the undoped GaAs layers [2] and [4] in Fig. 6 of Tanimoto. Additionally, Mr. Osada asserts that Tanimoto does not disclose or suggest that the teaching of the spacer layer width provided by the

prior art can be applied to the invention within Tanimoto. In fact, this paragraph indicates that when the spacer layer width is as disclosed in the prior art, the electron mobility will be outside of the presently claimed range.

Therefore, Applicants respectfully submit that the presently claimed invention is not rendered obvious by the cited references, and Applicants respectfully request the reconsideration and withdrawal of this rejection.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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